

The diffuse interstellar medium

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The diffuse interstellar medium, with its ionized, atomic and molecular components, contributes a major fraction of the far infrared and submillimeter line and continuum emission of the Milky Way and external galaxies. FIRST will give access to the main cooling lines of the diffuse interstellar medium, and to the diffuse continuum emission, with an unprecedented sensitivity and spectral resolution. Many issues such as the properties and spatial distribution of the interstellar medium phases will benefit from FIRST data. These issues are connected to crucial questions for extragalactic astronomy, for example the propagation of UV photons through the disks of spiral galaxies and the down conversion of UV photons to the far infrared and submillimeter. In addition, new perspectives on the chemical composition of the diffuse interstellar medium are expected, from full the opening of the submillimeter spectral window.